Abstract

Thesis: Synthesis of Substituted Pyrazolines as Inhibitors of *Staphylococcus aureus*

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One of the greatest global health concerns since the development of antibiotics has been the ability of bacteria to become resistant to the drugs known to treat infection. *Staphylococcus aureus,* is one of the most common bacteria involved in infection in the United States and some strains of *S. aureus* have found ways to become resistant to many drugs. Methicillin-resistant *S. aureus*, also known as MRSA, is hard to treat once an individual becomes infected due to its antibiotic resistance. A different approach to treating bacterial infections is needed to limit the possibility of resistance occurring.

A compound that has shown promise is ML141, which is a pyrazoline derivative that was discovered to inhibit CDC42. ML141 has a high specificity for CDC42, which is necessary to prevent the compound from binding to other similar sites which would cause unwanted interactions that would produce undesired side effects. Inhibition of CDC42 results in the inhibition of internalization of *S. aureus.* Goals of this research include developing compounds that have the same high selectivity for CDC42 while increasing the solubility and stability.